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Solicitation 1

Science Case

- The big questions
- Why DUSEL place among tool kit/international context
- Synergies

Methodology

- Working groups Science + cross cutting
- Workshops
- Infrastructure requirement matrices
- How to deal with different technical approaches?

Guarantee mechanisms

- PI's
- Site consultation group
- External Review

The Scientific Case

Science first!

The big questions

The neutrino properties

Nature of dark matter and dark energy

Matter/antimatter asymmetry and stability of matter

Ancient life/evolution/adaptation

Geological evolution /rock deformation/ earthquakes

Importance for society of underground science and engineering

Why DUSEL?

Unique within our set of tools

Long term investment

Likely demand and evolution of science

Strategic advantage of US location (s)

International context and partnership

Physics/Earth Science

Clearly something is happening

Partnership

Not only to boost political case

Money saving/new opportunities from co-location

e.g. Deep module

Instrumentation of the site before constuction and monitoring

Synergies

Technology MEMS, Data acquisition

Large caverns

Novel scientific methods

use of particle methods for earth exploration (neutrinos)

use of geophysics methods for particle detection?

Intellectual climate at site(s)

Multidisciplinary=> creativity

education of our students

education and outreach

Science Working Groups

1) Solar Neutrinos: Tom Bowles (LNAL) and Bruce Vogelaar (Virginia Tech)
2) Double Beta: John Wilkerson (U. of Washington) and TBD
3) Long baseline experiments: Milind Diwan (BNL) and Gina Rameika (Fermilab)
4) Nucleon Decay/atmospheric neutrinos: Hank Sobel (UC Irvine) and Chang-Kee Jung (Stony Brook)
5) Dark Matter: Dan Akerib (Case Western and Reserve) and Elena Aprile (Columbia)
6) Hydrology and coupled processes: Brian McPherson (U New Mexico), Eric Sonnenthal (LBNL)
7) Geochemistry: water rock interactions: TBD
8) Rock mechanics/seismology: Larry Costin (Sandia), Paul Young (U. of Toronto)
9) Applications: homeland security, storage (waste disposal, oil, carbon sequestration):Francois Heuzé (LLNL), Jean Claude Roegiers (U. of Oklahoma)
10) Biogeology methodology (Determining sampling objectives & sites, sampling strategies, contamination control, enhanced methodologies for biomarker analysis) Tommy Phelps, (Oak Ridge), Tom Kieft (Mexico Tech)
11) Micro and molecular biology (Microbial diversity, physiology, activity and molecular evolution): Jim Fredrickson (Pacific Northwest), TBD
12) Low background counting facilities and prototyping (pre-DUSEL and at DUSEL): Prisca Cushman (U. Minnesota) and Harry Miley (Pacific Northwest Lab)
13) Education and Outreach: Willi Chinowski, (LBL) Susan Pfiffner (U. of Tennessee) + Laboratory Astrophysics/Accelerators

Cross Cutting Working Groups

Modules

- Multidisciplinary
  - Deep modules
  - Large modules

Lab infrastructure

- Lab layout/evolution / instrumentation
- Support/central facilities/access
- Management requirements
  - scientist oversight
  - multidisciplinary mechanisms
  - single site/ integrated multi sites
- E&O infrastructure (group 13)

Demand/ national facilities and international context

Time Table

Sept 15 Proposal

15-25 pages

Continuing work on infrastructure needs to have impact on solicitation

Official approval Dec 1?

Proposed workshops

Denver Jan 05 ?

Further integration of Earth Sciences and Physics

Washington DC Mar 05?

Conclusions

Participation of agencies

Final report ≈ 50 pages

External review (NRC style)

Guarantee Mechanisms

PI's

Gene Beier, U Penn (Particle Physics)

Charles Fairhurst, U Minnesota (Engineering/Geology)

Tullis Onstott, Princeton (Biogeology)

Hamish Robertson, U Washington (Nuclear Physics)

Bernard Sadoulet, UC Berkeley (Astrophysics)

James Tiedje, Michigan State (Biology)

Site Consultation Group

BNL: Tom Kirk and Nick Samios
Cascades: Wick Haxton and John Wilkerson (U. of Washington)
Fermilab: Ken Stanfield and Hugh Montgomery
Henderson mine: Chang-Kee Jung (Stony Brook) and Bob Wilson (Colorado State)
Homestake: Kevin Lesko and Willi Chinowsky
Kimballton: R. Bruce Vogelaar and Bob Bodnar (Virginia Tech)
LBL: James Symons and Jim Siegrist
San Jacinto: Hank Sobel and Bill Kropp (UC Irvine)
Soudan: Marvin L. Marshak and Earl A. Peterson (U. Minnesota)
Sudbury: Andrew Hime (LANL) and David Sinclair (Carleton)
WIPP: Roger Nelson and Lloyd Piper

Possibility of two groups: site and national labs

Add earth scientists at each site

Budget

First iteration

Sum of Total	Sub-Activity	□	□	□	□	□	□
Activity	Costs	Salary Support	Staff Support	Tele Confer	Travel	Writer	Grand Total
Administration	□	□	6768	□	□	□	6768
Consulting engineers	87600						87600
PI Team	□	45120		3655	14400		63175
Publication	22560		12032		2400	30080	67072
Working Groups	□	45120		30196	132000		207316
Workshops	50000		18048				68048
Grand Total	160160	90240	36848	33851	148800	30080	499979